

Serial No.: 09/814,590

### LISTING OF CLAIMS

1. (Currently amended) A device for modulating a carrier signal comprising:
  - (a) a mapper generating a first data signal at a selected one of a plurality of baud rates, the first data signal comprises an I-channel first data signal and a Q-channel first data signal;
  - (b) a scaler multiplying the first data signal by one of a plurality of predetermined scaler values selected to correspond to the baud rate to generate a scaled data signal, the scaled data signal comprises an I-channel scaled data signal and a Q-channel scaled data signal and wherein the complex mixer includes:
    - (i) a first multiplier and a second multiplier each multiplying the I-channel scaled data signal by a sine waveform and a cosine waveform respectively;
    - (ii) a third and fourth multiplier each multiplying the Q-channel scaled data signal by the sine waveform and a cosine waveform respectively;
    - (iii) a first summer adding the result of the second multiplier to the result of the third multiplier multiplied by negative one to generate the I-channel frequency shifted scaled data signal; and
    - (iv) a second channel summer adding the result of the first multiplier and the result of the fourth multiplier to generate the Q-channel frequency shifted scaled data signal;
  - (c) a complex mixer for generating a frequency shifting scaled data signal, the frequency shifted scaled data signal comprises an I-channel frequency shifted scaled data signal and a Q-channel frequency shifted scaled data signal;
  - (d) an upsampler circuit for increasing the sampling frequency of the frequency shifted scaled data signal; and
  - (e) a pulse shaper circuit for generating a digital representation of a modulated carrier signal in accordance with the frequency shifted scaled data signal, wherein the pulse shaper circuit includes a finite impulse response filter and a

Serial No.: 09/814,590

coefficient matrix storing a set of coefficients for each of the I-channel and the Q-channel.

2. (Canceled)

3. <sup>2</sup> (Currently amended) The device for modulating a carrier signal of claim ~~[[2]]~~ 1, wherein the first data signal is a digital data signal with a sampling frequency corresponding to the highest of the plurality of baud rates.

4. <sup>3</sup> (Original) The device for modulating a carrier signal of claim ~~3~~ <sup>2</sup>, wherein each of the predetermined scaler values is a value which provides for the scaled data signal to have approximately the same signal strength independent of baud rate.

5. (Canceled)

6. <sup>4</sup> (Currently amended) The device for modulating a carrier signal of claim ~~[[5]]~~ 1, wherein the sine waveform and the cosine waveform each have a frequency of one fourth the sampling frequency.

7. (Canceled)

8. <sup>5</sup> (Previously presented) The device for modulating a carrier signal of claim ~~3~~ <sup>2</sup>, wherein the plurality of baud rates are 2 Mbaud and 4 Mbaud and the sampling frequency is 4 MHz.

9. <sup>6</sup> (Previously presented) The device for modulating a carrier signal of claim ~~8~~ <sup>5</sup>, wherein the predetermined scaler values are a value of 1 corresponding to the 2 Mbaud rate and a value of 2/3 corresponding to the 4 Mbaud rate.

Serial No.: 09/814,590

10. <sup>7</sup> (Currently amended) A device for modulating a carrier signal comprising:
- (a) a mapper generating a first data signal at a selected one of a plurality of baud rates;
  - (b) a scaler multiplying the first data signal by one of a plurality of predetermined scaler values selected to correspond to the baud rate to generate a scaled data signal;
  - (c) a complex mixer for generating a frequency shifting scaled data signal;
  - (d) an upsampler circuit for increasing the sampling frequency of the frequency shifted scaled data signal; and
  - (e) a pulse shaper circuit for generating a digital representation of a modulated carrier signal in accordance with the frequency shifted scaled data signal, wherein the pulse shaper circuit includes a finite impulse response filter and a coefficient matrix storing a set of coefficients for each of the I-channel and the Q-channel;

The device for modulating a carrier signal of claim 1, wherein the finite impulse response filter is a 16 tap finite impulse filter and each set of filter coefficients includes 9 non-zero coefficients, each coefficient being a 10 bit coefficient.

11-14. (Canceled)

15. <sup>8</sup> (Previously presented) A method for modulating a carrier signal, the method comprising:
- (a) generating a first data signal at a selected one of a plurality of baud rates, including generating an I-channel first data signal and a Q-channel first data signal;
  - (b) scaling the first data signal by one of a plurality of predetermined scaler values selected to correspond to the baud rate to generate a scaled data signal, including scaling the I-channel first data signal and the Q-channel first data signal;

Serial No.: 09/814,590

(c) mixing the scaled data signal with a frequency signal to generate a frequency shifted scaled data signal, including complex mixing of both the I-channel scaled data signal and the Q-channel scaled data signal;

(d) increasing the sampling frequency of the frequency shifted scaled data signal; and

(e) filtering the frequency shifted scaled data signal to generate a digital representation of a modulated carrier signal, wherein filtering the frequency shifted scaled data signal includes finite impulse response filtering utilizing a set of predetermined filter coefficients for each of the I-channel and the Q-channel; wherein:

the first data signal is a digital data signal with a sampling frequency corresponding to the highest of the plurality of baud rates,

each of the predetermined scaler values is a value which provides for the scaled data signal to have approximately the same signal strength independent of baud rate, and

the step of complex mixing the scaled data signal includes:

(i) subtracting the result of the Q-channel scaled data signal multiplied by a sine waveform from the result of the I-channel scaled data signal multiplied by a cosine waveform to generate an I-channel frequency shifted data signal; and

(ii) adding the result of the Q-channel scaled data signal multiplied by a cosine waveform from the result of the I-channel scaled data signal multiplied by a sine waveform to generate a Q-channel frequency shifted data signal.

16. (Original) The method for modulating a carrier signal of claim 15, wherein the sine waveform and the cosine waveform each have a frequency of one fourth the sampling frequency.

17-18. (Canceled)

Serial No.: 09/814,590

- ~~10.~~<sup>10</sup> (Currently amended) A method for modulating a carrier signal, the method comprising:
- ~~— (a) — generating a first data signal at a selected one of a plurality of baud rates, including generating an I-channel first data signal and a Q-channel first data signal;~~
  - ~~— (b) — scaling the first data signal by one of a plurality of predetermined scaler values selected to correspond to the baud rate to generate a scaled data signal, including scaling the I-channel first data signal and the Q-channel first data signal;~~
  - ~~— (c) — mixing the scaled data signal with a frequency signal to generate a frequency shifted scaled data signal, including complex mixing of both the I-channel scaled data signal and the Q-channel scaled data signal;~~
  - ~~— (d) — increasing the sampling frequency of the frequency shifted scaled data signal; and~~
  - ~~— (e) — filtering the frequency shifted scaled data signal to generate a digital representation of a modulated carrier signal, wherein filtering the frequency shifted scaled data signal includes finite impulse response filtering utilizing a set of predetermined filter coefficients for each of the I-channel and the Q-channel; wherein:~~  
~~the first data signal is a digital data signal with a sampling frequency corresponding to the highest of the plurality of baud rates;~~

The method for modulating a carrier signal of claim 15, wherein the plurality of baud rates are 2 Mbaud and 4 Mbaud and the sampling frequency is 4 MHz, and the predetermined scaler values are a value of 1 corresponding to the 2 Mbaud rate and a value of 2/3 corresponding to the 4 Mbaud rate.

- ~~20.~~<sup>11</sup> (Previously presented) A method for modulating a carrier signal, the method comprising:
- (a) generating a first data signal at a selected one of a plurality of baud rates;
  - (b) scaling the first data signal by one of a plurality of predetermined scaler values selected to correspond to the baud rate to generate a scaled data signal;

Serial No.: 09/814,590

- (c) mixing the scaled data signal with a frequency signal to generate a frequency shifted scaled data signal;
- (d) increasing the sampling frequency of the frequency shifted scaled data signal; and
- (e) filtering the frequency shifted scaled data signal to generate a digital representation of a modulated carrier signal, wherein filtering the frequency shifted scaled data signal includes finite impulse response filtering utilizing a set of predetermined filter coefficients for each of the I-channel and the Q-channel, wherein:
  - the finite impulse response filtering is 16 tap filtering and each set of filter coefficients includes 9 non-zero coefficients, each coefficient being a 10 bit coefficient.

21. (Canceled)